

ENGINEERS AUSTRALIA
HERITAGE RECOGNITION PROGRAMME

ENGINEERING HERITAGE AUSTRALIA
QUEENSLAND DIVISION

Nomination Document for
NORMANTON TO CROYDON RAILWAY LINE
NORTH QUEENSLAND



Submitted by: Engineering Heritage Queensland.
Prepared for EHQ by A. Churchward,
October 2017

CONTENTS

- 1. Nomination Form**
- 2. Heritage assessment**
- 3. Assessment of Significance**
- 4. Images and drawings**
- 5. Interpretation Plan**
- 6. Heritage Ceremony**
- 7. Correspondence with the Owner**
- 8. References**
- 9. Acknowledgements**

1. NOMINATION FORM

The Administrator
Engineering Heritage Australia
Engineers Australia
Engineering House
11 National Circuit
BARTON ACT 2600

Name of work. Normanton to Croydon Railway Line

This work is nominated for an award under the Heritage Recognition Program of Engineers Australia.

Location, including address and map grid reference if a fixed work

Normanton to Croydon in Far North Queensland.

Map grid reference not included

Owner (name & address):

Queensland Rail
GPO Box 1429
Brisbane QLD 4001

The owner has been advised of this nomination and a letter of agreement is attached.

Access to site: The site can be accessed via Normanton Railway Station. Tourist trains run regularly

Nominating Body. Engineering Heritage Queensland

...Andrew Barnes.....
Chair of Nominating Body
Date: October 2017

....Andrew Barnes.....
Chair of Divisional EHA Group
Date: October 2017

2. HERITAGE ASSESSMENT

BASIC DATA:

Item Name:	NORMANTON TO CROYDON RAILWAY LINE		
Other/ Former Names:	na		
Location:	Normanton to Croydon, North Queensland		
Address:	na.		
Suburb/ Nearest Town:	Normanton and Croydon		
State:	QLD		
Local Govt Area:	Carpentaria Shire and Croydon Shire.		
Owner:	Queensland Railways		
Current Use:	Existing rail line operated by Queensland Rail		
Former Uses:	Refer to 'Current Use'.		
Designer:	George Phillips		
Maker/ Builder:	Day labour under the supervision of George Phillips		
Year Started:	July 1888.	Year Completed:	July 1891
Physical Description:	The railway line linking Normanton to Croydon, a distance of 94 miles (169 kms) is the last isolated line of Queensland Rail still in use. It utilised an innovative system of submersible track with patented steel sleepers and retains buildings of considerable architectural and technical interest at Normanton. The focus of this submission is the design and construction of the railway line. The line is operational today mainly as a tourist facility.		
Physical Condition:	Remarkably, the track alignment and many of the rails and sleepers are still in good condition despite decades in the heat and wet of this part of Queensland. Queensland Rail has an active maintenance program for the infrastructure associated with the railway.		
Modifications/ Dates:	The railway has undergone regular maintenance since opening in 1891. However it retains much of the original materials and alignment.		
Historical Notes:	A railway line between Normanton and Cloncurry had been discussed as early as 1883. In 1885, the Glasgow based Cloncurry Copper Mining and Smelting Company released its prospectus to develop the Cloncurry mining field. The government decided to proceed with a railway from the port of Normanton to Cloncurry, connecting the copper deposits with the coast. The first section towards Cloncurry was approved on 16 November 1886, and 160 kilometres of rails were ordered for construction. This was a difficult stretch for carriers and a rail link would have been valuable to pastoral stations in the area and was planned to serve the Cloncurry Copper Mine. It was at the time intended to eventually link the		

new line with the Great Northern Railway connecting Charters Towers and the important port of Townsville. However, in November 1885 a major gold strike was reported at Belmore Station, 145 km east of Normanton and just to the north of what would become Croydon. By the end of 1886 the population of the Croydon field was 2000, rising to 6000 in the following year. Transportation was a major problem and access to this field became more important than the link to Cloncurry. In November 1887 it was decided to divert the line to Croydon.

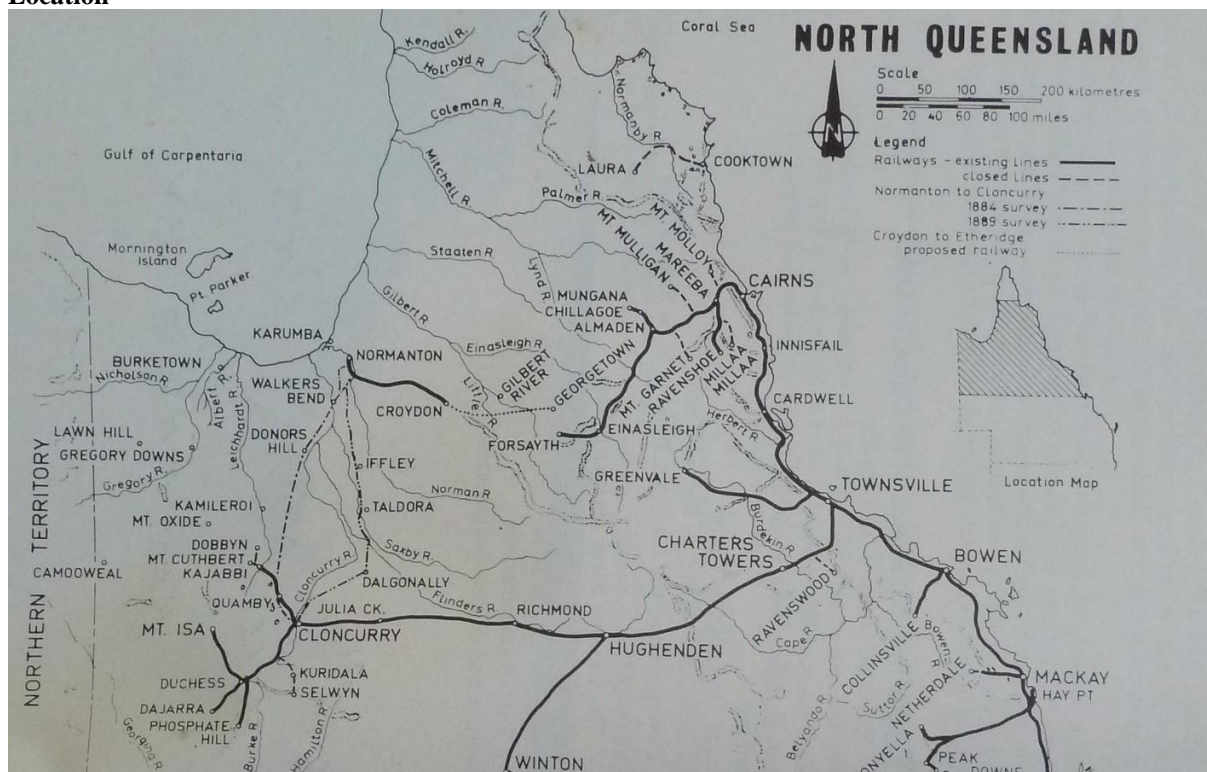
The railway line linking Normanton to Croydon was built between 1888 and 1891 and is the last isolated line of Queensland Rail still in use. The design principles adopted by the designer George Phillips were a radical departure from established practice in the building of the pioneer railways of Queensland at the time. The traditional form of railway construction was more akin to the European methods whereby track was laid on sleepers supported on ballast and generally above flood levels. This was expensive. Phillips proposed that for the flat country of western Queensland a more economical solution was to lay the track directly on sleepers on prepared natural surface. When constructed, the railway utilised an innovative system of submersible track with patented steel sleepers. These sleepers remain in use today.

Heritage Listing

The railway has been recognized by the Queensland Heritage Register administrated by the Department of Environment and Heritage Protection.

Place Name	Normanton to Croydon Railway Line
Place ID	600396
Register Entry Date	21/10/1992

Location



3. ASSESSMENT OF SIGNIFICANCE:

Historical Significance :

The line was technically innovative, in response to the terrain and the conditions. The country was flat but difficult for conventional railway tracks due to flooding, lack of suitable timber for sleepers and termite attack. In 1884 Phillips patented a system for taking railways across such country which utilised special U section steel sleepers laid directly on the ground. During floods the line could be submerged without washing out the ballast and embankments normally used, so that it could quickly be put back into service once the waters subsided. The steel sleepers were also impervious to termite attack, and although initially more expensive than timber sleepers, were cheaper to lay and maintain. The bridges along the line were also designed to be submersible. This system was particularly suited to the Gulf country and was specified for the Normanton to Croydon line with Phillips engaged to supervise the construction. Tenders were called in July 1887 to supply the steel sleepers and the first section to Haydon began in May 1888.

The construction method involved clearing a three metre wide band ahead of the rail which was stumped, ploughed, harrowed, rolled and lightly ballasted. The U shaped sleepers were then laid on this prepared surface and the rail attached to them by special clips. The construction train then passed over them forcing the U shape down into the ground and depressing the sleepers for above half their depth. Soft spots were then packed. The finished rails were intended to be 25 to 50 mm above the surface. However, in practice the sleepers became more deeply embedded with time. The first section of 61km to Haydon was opened in May 1889, then to Patterson's (Blackbull) in December 1890, and to Croydon in July 1891.

Historic Individuals:

George Phillips, in the context of the history of Europeans in Queensland is one of the larger than life figures, who had a long, productive, and very public life. At the time of his death in 1921, at the age of 77, he was referred to as one of the 'pioneers in the opening up of North Queensland'. In the latter part of the nineteenth century, and well into the early twentieth century, he was also equally acknowledged for his work in railway surveying. Phillips was a remarkably prolific individual, and his railway footprint can be found in many places throughout Queensland.

He was a Parliamentarian and an alderman. His actions and opinions were influential in Queensland for some 60 years, especially in railway matters.

Phillips was born in Burslem, Staffordshire, England, in 1843. He arrived in New South Wales in 1851 at the age of eight, finishing his schooling at Parramatta. He studied for the Law at Sydney and Melbourne and his working life began in the office of a solicitor in Melbourne. He trained in Brisbane as a surveyor, completing his training at the age of 19. According to family accounts, he wanted to travel north and enjoy an outdoor life and

in 1862 he began as a surveyor for the Queensland Government, firstly in the Roads Department, then the Lands Department. He accompanied William Landsborough on an expedition west of Bowen Downs, to look for the members of the Victorian Exploring Expedition led by Burke and Wills. On his westward journey with Landsborough, the party reached the Diamantina River. In 1866, the first Europeans to do so, Landsborough was sent to Burketown, as the Government Resident while Phillips surveyed the township of Burketown. An outbreak of Yellow Fever in Burketown drove both Landsborough and Phillips to look for a new settlement inland and the township site decided on was to become Normanton.

In 1867 Phillips explored from the Gulf south towards Cloncurry, activities that not only made him very familiar with the landscape and climate of that part of the North West, but later assisted him in his role as a surveyor and supervisor of railway lines. The following year Phillips was appointed staff surveyor for the Kennedy district, and made surveys of a number of towns and settlements in north Queensland, including Bowen, Townsville, Cardwell, Ingham and Mackay.

In 1874, Phillips was transferred to the Brisbane district, and five years later joined the Railway Department as 'Inspector of Railway Surveys in the Southern Division'. He held this position until 1886, when he left the employment of the Queensland government to work with a private railway development company. The initial railway scheme that Phillips was instrumental in investigating was to link the mineral fields of the Cloncurry

region to a port in the Gulf of Carpentaria

Creative or Technical Achievement:

A number of aspects come to the fore in relation to the engineering achievements of the rail line

1. In the late 1800s the development of Queensland was prominent. Cost of infrastructure was formidable. Phillips had developed a cost effective system to minimize costs and allow a suitable standard of service to meet the needs of the community. The concept of placing the rail grade line directly close to natural surface enabled a cost effective solution which could also recover from flooding quicker than a ballasted higher structure.
2. Phillips challenged the engineering standards of the day. In lieu of applying the adopted standards from overseas, he argued that it was viable to apply suitable standards when developing the remote parts of the country. Hence the use of sleepers directly on a prepared natural surface rather than the traditional ballast.
3. Ballast, however, is required for stability on a line, assisting with drainage and allowing for sleepers to maintain a stable surface for rails. To provide for stability, Phillips recommended using steel sleepers. The design patented by Phillips in 1884 had open ends for his steel sleepers which weighed around 42 kgs. Phillips also devised a series of rail fastenings and clips to hold the rails to the sleepers. In advance of laying the rail, the right of way was ploughed and lightly harrowed. The sleeper was then laid directly on the ground surface, gradually sinking with the weight of trains until the sides of the sleeper cut through the ploughed earth. As a result the sleeper came to be packed with soil. The sleepers were coated in pitch, to provide a waterproofing. Part of Phillips' reasoning for the use of steel as a construction material was related to his own direct experience in this part of the world. He was acutely aware of the difficulties that would be encountered in obtaining adequate supplies of timber for building, and railway sleepers. Steel sleepers were resistant to attack from termites, a common occurrence for timber in the tropics.

Research Potential:

The Normanton to Croydon Railway line is a living testament to the pioneers of the 19th century. It provides an insight to the public and to engineers of the challenges and solutions developed at the time. Queensland Rail continues to monitor the performance of this infrastructure.

Social:

The first major test came with the flooding of the Norman River during January 1890 covering 12½ miles (20 kms) of line. Trains were able to start operating again as soon as the waters receded. For those who had come to depend on the railway to deliver a reliable form of transport on the goldfields, there was a sense of jubilation. Croydon drank toasts and celebrated at the opening of the railway in 1891. It was quoted

“In the wet season the most active duck ever born would be sure to get hopelessly bogged. Before the railway was constructed the coach journey between the two towns was one of considerable difficulty and risk. Coaches were wrecked and bogged, while the unfortunate passengers were half poisoned with strange compounds obtained from unique accommodation houses or nearly done to death by mysterious insects which prowled around by night... All these terrors have been removed by the railway, and the traveller can now reach Normanton from Croydon in five or six hours... Mr. George Phillips's steel sleepers have been used, and have proved a great success.”

Rarity/Representativeness:

Whilst the use of steel sleepers has evolved in many railway lines around the country, the Normanton to Croydon Railway line is the only isolated rail line in Queensland with many of the original steel sleepers still in use.

Integrity/ Intactness:

The railway line remains in use today and provides a valuable tourist attraction .

Statement of Significance:

A railway line between Normanton and Cloncurry had been discussed as early as 1883 and was approved by Parliament in 1886. However with the discovery of gold 145km east of Normanton in 1885 transportation was a major problem and access to this field became more important than the link to Cloncurry. It was decided to divert the line to Croydon.

The line was technically innovative, in response to the terrain and conditions. The country was flat but difficult for conventional railway tracks due to flooding, lack of suitable timber for sleepers and termite attack. In 1884 George Phillips patented a system for taking railways across such country which utilised special U section steel sleepers laid directly on the ground. During floods the line could be submerged without washing out the ballast and embankments normally used, so that it could quickly be put back into service once the waters subsided. The steel sleepers were also impervious to termite attack, and although initially more expensive than timber sleepers, were cheaper to lay and maintain. The bridges along the line were also designed to be submersible. This system was particularly suited to the Gulf country and was specified for the Normanton to Croydon line with Phillips engaged to supervise the construction. Tenders were called in July 1887 for the supply of steel sleepers and the first section to Haydon began in May 1888.

The construction method involved clearing a three metre wide band ahead of the rail which was stumped, ploughed, harrowed, rolled and lightly ballasted. The U shaped sleepers were then laid on this prepared surface and the rail attached to them by special clips. The construction train then passed over them forcing the U shape down into the ground and depressing the sleepers for above half their depth. Soft spots were then packed. The finished rails were intended to be 25 to 50 mm above the surface. However, in practice the sleepers became more deeply embedded with time. The first section of 61km to Haydon was opened in May 1889, then to Patterson's (Blackbull) in December 1890, and to Croydon in July 1891.

George Phillips was born in England in 1843 and died on June 2, 1921 in Queensland; his family migrated to Australia when he was eight. He qualified as a surveyor. In 1874 he joined the Railway Department and remained in its service until 1886 as surveyor and engineer. In 1888 Phillips was contracted by the government to survey and supervise the construction of the Normanton to Croydon Railway. He demonstrated his ingenuity in challenging the design standards of the day, in developing technical solutions appropriate to the environment and in supervising the construction of the railway. From 1893 to 1896 Phillips was the MLA for Carpentaria

Area of Significance:

This proposal seeks a listing for an Engineering Heritage Marker.

4. IMAGES and DRAWINGS

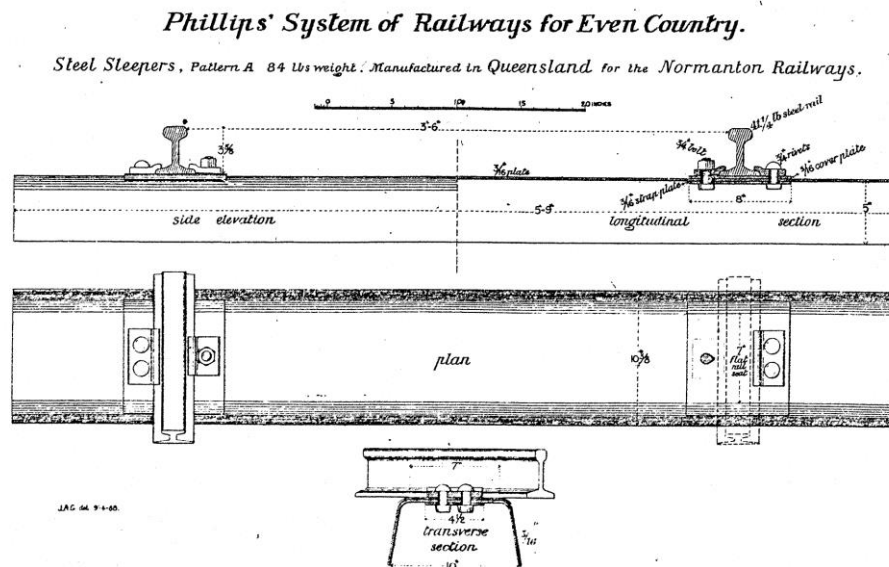


Fig 1 The steel railway sleeper patented by George Phillips



Fig 2 Construction

Head of construction at the 25 1/2 mile mark, looking towards Croydon, in 1888. The right of way can be seen prepared, with sleepers ready to be placed onto the ground by the plate laying gang. Rails would then be fastened to the sleepers. The photo was taken with the photographer balancing on top of the cab of the A10 Class locomotive. (Phillips Album)



Fig 3 The sleepers and track in 2016

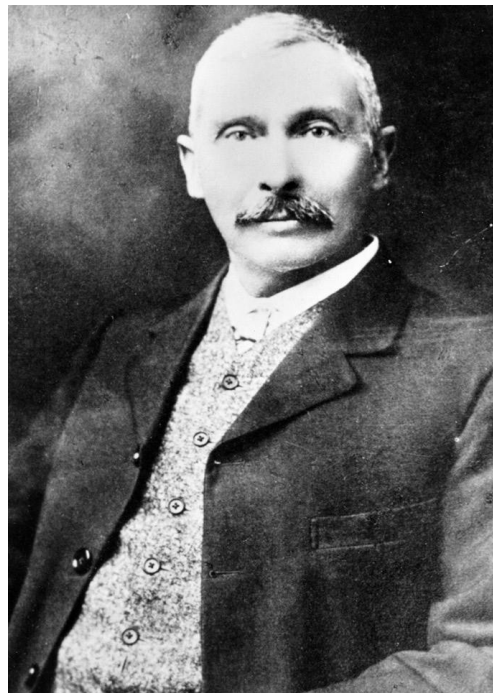


Fig 4 *George Phillips, photographed at Sandgate, 1907. (Picture Queensland, State Library of Queensland)*

5. INTERPRETATION PLAN

The Interpretation Panel will be designed later in the year and submitted for approval to the committee.

Content would include

- History of the area
- Design concepts of the steel sleepers
- Extracts from George Phillips paper including sketches.
- Information on Phillips and his career

It is planned that the panel and marker be located at the Normanton Railway Station and that a duplicate panel be located at Croydon Railway Station.

6. HERITAGE CEREMONY

It is proposed to have the ceremony in Autumn 2018.

It is likely that a ceremony will be held in Brisbane and maybe coordinated with QR staff in Normanton.

7. CORRESPONDENCE WITH THE OWNER (Queensland Rail)

Our ref: MCR-17-660

Mr Andrew Barnes
Chair
Engineering Heritage Queensland
447 Upper Edward Street
BRISBANE QLD 4000

Dear Mr Barnes

I refer to your correspondence dated 29 May 2017 regarding engineering heritage recognition of the Normanton to Croydon rail line.

As you are aware, the construction of the Normanton to Croydon line played an important role in Queensland's history.

Given the significant role this line played in Queensland's rail story, the Normanton to Croydon Line was added to the Queensland Heritage Register on 21 October 1992.

As such, I'm pleased to inform you Queensland Rail supports the nomination of this line under the Engineering Heritage Recognition Program by Engineering Australia.

Yours sincerely



Nick Easy
Chief Executive Officer

5 July 2017

8. REFERENCES

1. "Pioneer Railways for Queensland" George Phillips 1892
2. "Lonely Rails in the Gulf Country" J W Knowles 1983
3. Queensland Heritage Register – No 600396
Department of Environment and Heritage Protection
4. "George Phillips and the Normanton to Croydon Railway" Greg Hallam 2017
THE ROYAL HISTORICAL SOCIETY OF QUEENSLAND

9. ACKNOWLEDGMENTS

EHQ wishes to acknowledge the support of the following in preparing this submission.

1. Greg Hallam (Queensland Rail)
2. Ken Fairbairn (Queensland Rail, Normanton)
3. Albert Jeays (Descendant of George Phillips)

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